Albrecht®

Annex to User Manual AE 540

Programming of AE 540 for commercial radio applications (PMR or similar)

The AE 540 comes with factory default setting (Mode 0, no jumper) with the fully extended frequency range from 136 to 174 MHz. Authorized service technicians may limit the user switchable frequency range by hardware jumpers which can be plugged on the front panel PCB to **fixed frequency settings** (PMR use) or the official **amateur VHF frequency ranges 144-146 or 144 to 148 MHz.** Software-settings without opening the radio are not possible. The jumpers (see annex) can be soldered or plugged. Computer-, ATAPI CD-, or hard disk drive jumpers may be used. **For commercial radio use (only in countries, where allowed!)** we recommend the modes 3, 6 or 7 of the following truth table:

MODE	Jumper settings			TX	RX
	C 3	C 2	C 1		
0	**-**	**-**	**-**	**136.000 - 174.000MHz**	**136.000 - 174.000MHz**
1	yes	-	-	144.000 - 147.995MHz	136.000 - 174.000MHz
2	-	yes	-	144.000 - 145.995MHz	144.000 - 145.995MHz
3	**yes**	**yes**	**-**	**Blocking of VFO mode for standard commercial use**	
4	-	-	yes	144.000 – 145.995 MHz	136.000 - 174.000MHz
5	yes	-	yes	146.000 - 174.000MHz	146.000 - 174.000MHz
6	**-**	**yes**	**yes**	**Slave (for special commercial use as mobile station)**	
7	**yes**	**yes**	**yes**	**Master (for special commercial use as base station)**	

- means: no jumper installed or soldered, contact pair open
yes means: jumper is inserted or soldered

Standard- commercial radio use (Mode 3)

In mode 3 all keys except the rotary switch are without function. The rotary switch only allows selection of **1 to max 10 predefined frequency settings**, which have been stored previously by service persons into memory locations of the radio under mode 0.
The **CTCSS** module may be plugged in to create a **closed user group**. Everything must be programmed under mode 0 accordingly into a free memory location. After programming, the jumpers shall be set to mode 3. User can then only operate the radio on the intended memory location(s).
DTMF may be used in mode 3, but only on transmit side to generate DTMF numbers manually via keyboard.
Automatic DTMF transmitting or decoding is not possible in mode 3, because there are no keys free for such an option. A Reset does not change the settings (requirement for PMR use)

- Open the radio, check jumpers and **remove all**, if installed to reach mode 0.
- **Program** each intended frequency setting **completely** (e.g. with CTCSS settings, if installed) in **1** or **up to 10** possible **memory location(s)**.
- Switch the radio off, **insert or solder** jumpers for C2 and C3 (for mode 3)

After switching on the radio only works on the predefined settings. User can select the settings via rotary knob, if more than 1 setting has been provided. No setting is erased if user should try a general reset. User has no longer any keyboard function, which could extend the frequency capability.

Special Commercial Use Option (Mode 6 und 7)
MASTER und SLAVE Mode

These 2 modes are intended for special applications (e.g. for taxi - dispatcher communications) which provide Identity **digital code transmission** and **ID-code display** in the central station. The system provides automatic receiver muting when not in use. It is necessary to select different settings as MASTER and SLAVE stations.

Communication Mobile to Base:

- Press PTT only at **mobile station (SLAVE)** .

The **mobile** station (Slave) **automatically transmits its ID code** to the dispatcher's **base station**. There the dispatcher will see the **code numbers of the mobile station in his display**. He can answer simply by pressing his PTT key . The base station will automatically use the code of the mobile station for its answer, so that the CPU on the mobile side can decode this number and open the speaker of the mobile station.
The central station (base station, master) can **delete the display ID code** by using the **SCAN** button after communication is finished.

Communication Base to Mobile:

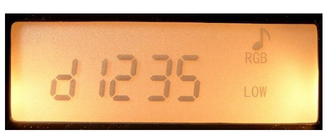
- Before calling, dispatcher (at **master** station) must **enter the ID number** of the desired mobile station.
- Press **SCAN** at microphone, then key in the **4 digit number** completely.
- Press **PTT** button for code transmission and for talking. ID codes will be transmitted automatically at the beginning of each PTT use. So wait a moment before you speak the first word!
- If necessary, display may be reset by using **SCAN**

Each Number contains two parts: the first 2 digits are the **group number Gr** 01 to 99, which distinguishes the whole network from others. The last 2 digits are the ID codes of the individual stations and are normally variable. ID codes from **Id** 01 to 99 may be used.

Example: the number **1234** means: **radio 34** in **group 12**

- A **MASTER** station can at anytime use the **SCAN button** to erase numbers and can enter other numbers for selective calling SLAVE stations of the network. The number in the display will be transmitted automatically when **PTT** is pressed next time.

- A **MASTER** station can only place a selective call to somebody else, when he has entered the number of this desired station before. If a master station should have erased the number of the last radio conversation by **SCAN** , he must enter the new number before pressing the PTT.



- A **SLAVE** station cannot enter any different codes, because the radio's keyboard is blocked and the slave can only transmit its own number, preprogrammed by the service person.

Monitoring radio traffic on the channel
To listen to other stations or radio traffic on the channel, the **MONI** key at the microphone may be used on master and slave sides. Pressing the key will temporarily open the squelch and the receiver muting, as long as it is kept pressed.

Communication “MASTER to all SLAVES” (group calling)

A Master station can call all members of his network together by using the group **code “00”** instead of the individual number(s) of slave(s).
Example: The group code is 12, the network has 3 slaves with **34** , **35** and **36** . The Master can call all his 3 slaves (or more) together by using **12 00** as code instead of using individual numbers **12 34**, **12 35** or **12 36.**

Communication “SLAVE to SLAVE”:

Such conversations are not possible in this specialized mobile- to- dispatcher radio system, as long as every slave station is using its own code number. The reason is the fact that every slave station can only open the speaker when it receives its own individual code number. If slave-to-slave conversation should be desired, all mobile (slave) radios in the network must be adjusted to the same number(s). The disadvantage of such a programming is, that selective calling and displaying of individual slave stations in the master station is not possible any longer, because all mobiles use the same numbers.

Programming the radios (valid for Master *and* Slave as well!)

Programming of radios is only possible after opening both sides of the cabinet. Only qualified service people who are familiar with miniaturised electronic circuits and SMD parts soldering can do this job!

- Open both cabinet sides of the radio.
- Check that **capacitor C 39 0.1 µF** is installed on the soldering side of the main board and check **activation jumper** of this capacitor. The radio comes with open jumper. Please close this jumper by soldering (necessary for modes 6 and 7, see also annex with photos). Enter frequencies under mode 0 (without jumpers) into 1 or more memory locations.
- Make sure that no DTMF or CTCSS board is installed- the digital calling system cannot work with DTMF and/or CTCSS
- Insert jumpers for **mode 7** (all 3 jumpers)
- Start **setup menu** with **FUNC** >0.5 s etc, until you reach menu step **Gr**. Enter the 2 digits **group** number **01-99**, switch to next menu step **Id** and enter the next 2 digits **01-99**.
- Quit setup menu (e.g. by short pressing of **PTT**)

Selection of radio (for Slave (mobile) or Master?)

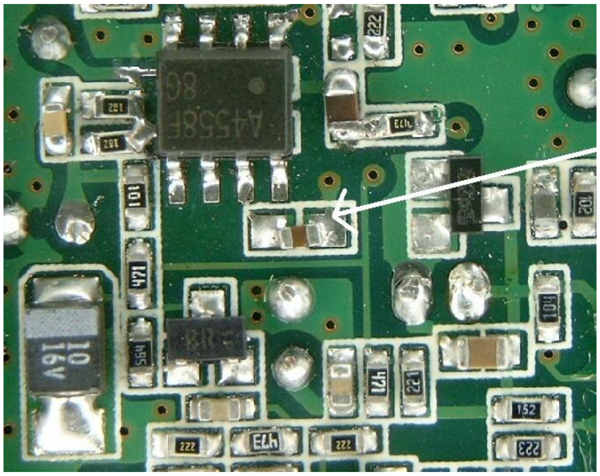
Modification from MASTER to SLAVE

- **MASTER**-radios do not need to be modified again, close cabinet.
- In mobile radios **(SLAVE)** the jumper settings, initially for Master, must be modified to SLAVE. Simply delete Jumper **C3** again after programming. Only **SLAVE** jumpers C 1 and C 2 remain (see photos in annex)
- Close cabinet again

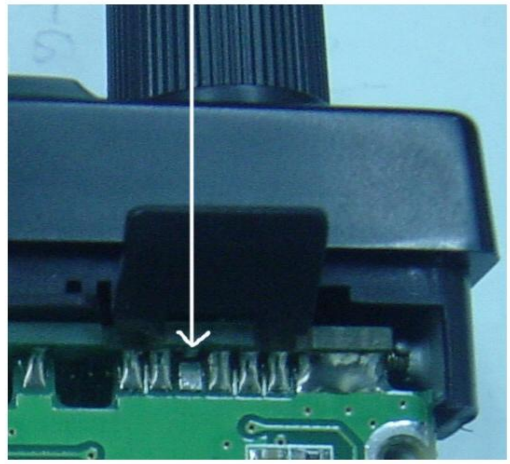
Note:
Please make sure that no additional modules for CTCSS and /or DTMF shall remain installed when using the special commercial radio functions of mode 6 and 7!

Annex:

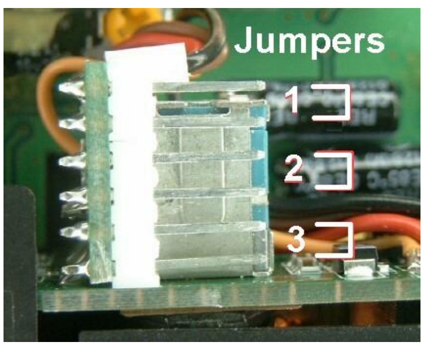
Position of capacitor C 39



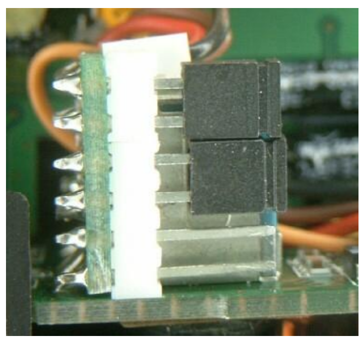
Position for activation jumper of C 39
Close (=solder) for Mode 6 & 7



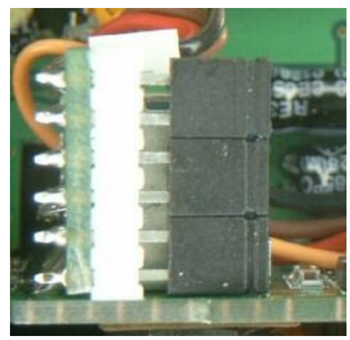
Jumper positions



No jumper - Mode 0
This is the initial setting
for all programmings!



Slave-jumpers for
use as mobile radio
in mode 6



Master-jumpers for
use as base station
in mode 7

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